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261 Madison Avenue  
New York, NY 10016-2391  
Phone: (212) 986-4090  
Fax: (212) 818-9479  
E-MAIL: MFNGK@AOL.COM

Assistant Commissioner for Patents **U.S. PTO**  
Washington, DC 20231

Date: July 6, 1999

Docket No: YOO-PN0321

Sir:

07/06/99

Transmitted herewith for filing is the Patent Application (37 CFR 1.53(b)) in the name(s) of:  
**Kwang-Ho JUNG, Woo-Sic HAN and Jung-Eun CHOI**

FOR: **METHOD FOR CONSTRUCTING WVPN (WIRELESS VIRTUAL PRIVATE NETWORK)  
FOR CDMA**

ENCLOSED ARE:

- (X) 7 pages of Specification, 3 pages of Claims (# of claims 3) & Abstract;
- (X) Figs. 1 - 2 / Two (2) sheet(s) of Drawings;
- (X) Declaration and Power of Attorney;
- (X) Assignment to: *Hyundai Electronics Industries Co., Ltd. with PTO-1595;*
- ( ) Certified copy(ies) of *Korean Pat. Appli. No. 98-27915 filed July 10, 1998,* the priority(ies) of which is(are) claimed under 35 USC 119; **TO FOLLOW**
- ( ) Verified Statement to establish Small Entity Status (37 CFR 1.9 & 1.27);
- (X) Information Disclosure Statement, PTO-1449 and 3 reference(s);

THE FILING FEE HAS BEEN CALCULATED AS SHOWN BELOW:

	Claims filed		Extra	—SMALL \$ <del>380.00</del>	LARGE \$ 760.00	AMOUNT \$ 760.00
Total Claims	3	Minus 20		x \$ <del>9.00</del>	x \$ 18.00	\$ .00
Independent	1	Minus 03		x \$ <del>39.00</del>	x \$ 78.00	\$ .00
Multiple dependent claim fee				+ \$ <del>130.00</del>	+ \$ 260.00	\$ .00
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- (X) Any patent application processing fees under 37 CFR 1.17
- (X) Any filing fees under 37 CFR 1.16 for the presentation of extra claims

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Respectfully submitted

JHN:ram

*J. Harold Nissen*  
J. Harold Nissen - Reg. No. 17,283

METHOD FOR CONSTRUCTING WVPN(WIRELESS VIRTUAL PRIVATE NETWORK)  
FOR CDMA

BACKGROUND OF THE INVENTION

5           1. Field of the Invention

          The present invention relates to a CDMA(Code division  
Multiple Access) system, and in particular to a method for  
constructing a WVPN(Wireless Virtual Private Network) for a CDMA  
which makes it possible to construct the WVPN which may use a mobile  
10   phone network as a private network.

          2. Description of the Background Art

          In the conventional CDMA system, in order to construct a  
VPN(Virtual Private Network), as disclosed in the U.S. Patent  
15   Number 5,339,356, a PBX(Private Branch Exchange) is installed for  
thereby constructing the VPN.

          Therefore, in the conventional art, since the VPN is  
constructed based on the PBX, the construction cost of the PBX is  
increased, and an advanced high technique is required for  
20   installing the same, so that the installation cost is also  
increased.

SUMMARY OF THE INVENTION

          Accordingly, it is an object of the present invention to

provide a method for construction a WVPN for a CDMA system, which is capable of constructing the WVPN using a certain extension number between subscribers for a WVPN group.

To achieve the above object, there is provided a method for  
5 constructing a WVPN for a CDMA system comprising the steps of a first  
step for registering a private network group and extension number  
to the SCP and judging whether a call by a certain calling subscriber  
corresponds to an extension number or a MDN (Mobile Directory  
Number) when a certain calling subscriber calls a certain receiving  
10 subscriber of the same group as the calling subscriber, and a second  
step for constructing a mobile communication network using the MDN  
in the case that as a result of the first step the call by the calling  
subscriber corresponds to the MDN and constructing a WVPN in the  
case that the call by the calling subscriber corresponds to the  
15 extension number, wherein the method for constructing a  
WVPN (Wireless Virtual Private Network) for a CDMA system includes  
a mobile telephone serviced by a private network group, a BTS (Base  
Transceiver System) for transmitting and receiving a message with  
the mobile telephone, a BSC (Base Station Controller) for managing  
20 the BTS, a MSC (Mobile Switching Center) including a MSA (Mobile  
Signaling Access), a MCC (Mobile Call Control), and a VLR (Visitor  
Location Register), a HLR (Home Location Register), and a  
SCP (Service Control Point) for storing an extension number with  
respect to a calling subscriber serviced by a private network group.

Additional advantages, objects and features of the invention will become more apparent from the description, which follows.

#### BRIEF DESCRIPTION OF THE DRAWINGS

5       The present invention will become more fully understood from the detailed description given hereinbelow and the accompanying drawings which are given by way of illustration only, and thus are not limitative of the present invention, and wherein:

10       Figure 1 is a block diagram illustrating a mobile communication system according to the present invention; and

      Figure 2 is a flow chart for explaining a method for constructing a WVPN for a CDMA system according to the present invention.

#### 15       DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

      The embodiments of the present invention will be explained with reference to the accompanying drawings.

      Figure 1 is a block diagram illustrating a mobile communication system according to the present invention.

20       As shown therein, the mobile communication system according to the present invention includes a mobile telephone 100 serviced by a private network group, a BTS (Base Transceiver System) 200 for transmitting and receiving a message with the mobile telephone 100, a BSC (Base Station Controller) 300 for managing the BTS 200, a

MSC (Mobile Switching Center) 400 including a MSA (Mobile Signaling Access) 410, a MCC (Mobile Call Control) 420, and a VLR (Visitor Location Register) 430, a HLR (Home Location Register) 500, and a SCP (Service Control Point) for storing an extension number with  
5 respect to a calling subscriber serviced by a private network group.

The method for constructing the WVPN for a CDMA system according to the present invention will be explained with reference to the mobile communication system adapted to the embodiment of the present invention.

10 First, in a step S10, in order to subscribe a private network, a user subscribes the private network at a telephone service company or the like, the telephone service company provides a private network group information, an extension number and a MDN (Mobile Directory Number) corresponding to a subscriber's extension  
15 number.

In a step S20, when a certain calling subscriber serviced by the private network group calls a certain receiving subscriber serviced by the same group using the mobile telephone 100, the above-described call is transferred to the MSA 410 of the MSC 400  
20 via the mobile telephone 100, the BTS 200 and the BSC 300.

The MSA 410 receives the call signal from the BSC 300 and transfers the same to the MCC 420.

In a step S30, the MCC 420 receives the call signal from the MSA 410 and judges whether the call by the calling subscriber

corresponds to an extension number call or a call using the MDN.

As a result of the judgement of the step S30, the call by the mobile telephone 100 corresponds to the extension number of the receiving subscriber of the same group, since the extension number  
5 is formed of three or four digits such as "123" differently from an existing MDN, it is possible to judge whether the call corresponds to the extension number call or a call using the MDN.

As a result of the judgement of the step S30, if the call by the calling subscriber is a call using the MDN, in a step S50, a  
10 normal call processing operation is performed.

As a result of the judgement of the step S30, if the call by the calling subscriber corresponds to the extension number call, in the step S40, a process is performed for constructing the WVPN using the mobile communication system as shown in Figure 1.

15 The step S40 will be explained in more detail.

First, in a step S41, the MCC 420 requests a telephone number to the VLR 430 with respect to the calling subscriber, and the VLR 320 requests the telephone number to the HLR 500 with respect to the calling subscriber, and the HLR 500 transmits the telephone number  
20 with respect to the calling subscriber to the MCC 420 via the VLR 430.

In a step S42, the MCC 420 receives a telephone number of the calling subscriber transmitted via the VLR 430 and outputs the telephone number and the extension number of the calling subscriber

to the SCP 600 and requests a MDN information of the receiving subscriber corresponding to the extension number.

In a step S43, the SCP 600 receives a calling subscriber telephone number from the MCC 420 and judges whether there is a group  
5 of the calling subscriber telephone.

As a result of the judgement of the step S43, in a step S44, it is judged whether the extension number is in the group of the calling subscriber.

As a result of the judgement of the step S44, if the extension  
10 number is in the group of the calling subscriber, in a step S45, the MDN information corresponding to the receiving extension number is transmitted to the MCC 420 via the VLR 430.

In a step S50, the MCC 420 performs a normal call processing operation based on the MDN information corresponding to the  
15 receiving extension number inputted via the VLR 430, so that the calling subscriber is connected with the receiving subscriber.

As a result of the step S43, if there is not a group of the telephone number of the calling subscriber, and as a result of the step S44, if the received extension number is not in the group of  
20 the calling subscriber, in a step S46, the calling subscriber is informed of a non-available call message for thereby performing a control operation.

As described above, a private network group information and an extension number are registered in the SCP of the mobile

communication system, and a telephone communication is implemented between the subscribers registered in the private network group using the extension number, so that the PBX is not used for constructing the private network in the present invention, whereby  
5 it is possible to decrease the cost of the PBX and the installation cost of the same.

Although the preferred embodiment of the present invention have been disclosed for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and  
10 substitutions are possible, without departing from the scope and spirit of the invention as recited in the accompanying claims.

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What is claimed is:

1. A method for constructing a WVPN(Wireless Virtual Private Network) for a CDMA system which includes a mobile telephone serviced by a private network group, a BTS (Base Transceiver System) for transmitting and receiving a message with the mobile telephone, a BSC (Base Station Controller) for managing the BTS, a MSC (Mobile Switching Center) including a MSA (Mobile Signaling Access), a MCC (Mobile Call Control), and a VLR (Visitor Location Register), a HLR (Home Location Register), and a SCP (Service Control Point) for storing an extension number with respect to a calling subscriber serviced by a private network group, a method for constructing a WVPN for a CDMA system comprising the steps of:

a first step for registering a private network group and extension number to the SCP and judging whether a call by a certain calling subscriber corresponds to an extension number or a MDN (Mobile Directory Number) when a certain calling subscriber calls a certain receiving subscriber of the same group as the calling subscriber; and

a second step for constructing a mobile communication network using the MDN in the case that as a result of the first step the call by the calling subscriber corresponds to the MDN and constructing a WVPN in the case that the call by the calling subscriber corresponds to the extension number.

2. The method of claim 1, wherein said second step includes:

a first sub-step for requesting a telephone of the calling subscriber to the HLR, transmitting a telephone number and extension number to the SCP with respect to the calling subscriber, requesting a MDN information of the receiving subscriber, and judging whether there is a group of the telephone number of the calling subscriber;

a second sub-step for judging whether the extension number transmitted to the SCP exists in the group of the calling subscriber in the case that when there is the group of the telephone number of the calling subscriber as a result of the judgement of the first sub-step; and

a third sub-step for constructing the WVPN by transmitting the MDN corresponding to the receiving extension number to the MCC in the case that the extension number exists in the group of the calling subscriber as a result of the judgement of the second sub-step.

3. The method of claim 2, further comprising a sub-step for transmitting a non-available call connection guide message to the calling subscriber in the case that there is not a group of the telephone number of the calling subscriber as a result of the judgement of the first sub-step and in the case that the extension number exists in the group of the calling subscriber as a result of

the judgement of the second sub-step.

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# ABSTRACT OF THE DISCLOSURE

A method for construction a WVPN for a CDMA system is disclosed. The method includes a first step for registering a private network group and extension number to the SCP and judging whether a call by a certain calling subscriber corresponds to an extension number or a MDN (Mobile Directory Number) when a certain calling subscriber calls a certain receiving subscriber of the same group as the calling subscriber, and a second step for constructing a mobile communication network using the MDN in the case that as a result of the first step the call by the calling subscriber corresponds to the MDN and constructing a WVPN in the case that the call by the calling subscriber corresponds to the extension number, wherein the method for constructing a WVPN (Wireless Virtual Private Network) for a CDMA system includes a mobile telephone serviced by a private network group, a BTS (Base Transceiver System) for transmitting and receiving a message with the mobile telephone, a BSC (Base Station Controller) for managing the BTS, a MSC (Mobile Switching Center) including a MSA (Mobile Signaling Access), a MCC (Mobile Call Control), and a VLR (Visitor Location Register), a HLR (Home Location Register), and a SCP (Service Control Point) for storing an extension number with respect to a calling subscriber serviced by a private network group, for thereby constructing the WVPN using a certain extension number between subscribers for a WVPN group.

FIG. 1

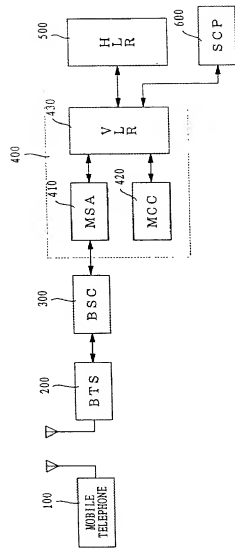
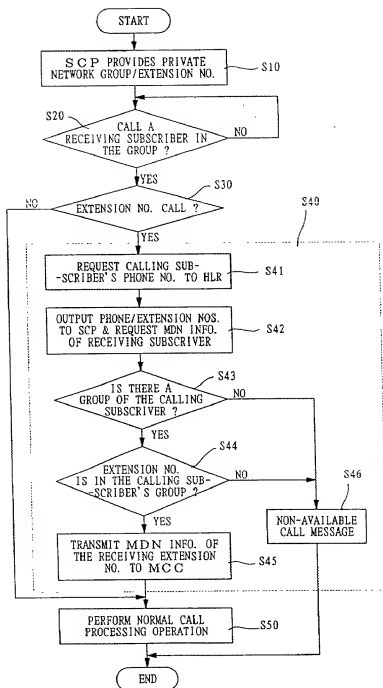


FIG. 2



**DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION**  
**(Joint Inventors)**

As the below named inventors, we hereby declare that:

Our residences, post office addresses and citizenships are as stated below next to individual names.

We believe we are the original, first and joint inventors of the subject matter which is claimed and for which a patent is sought on the invention entitled "Method for constructing WVPN (Wireless Virtual Private Network) for CDMA", the specification of which is attached hereto.

We hereby state that we have reviewed and understand the contents of the above identified specification, including the claims.

We acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56(a).

We claim the foreign priority benefits under Section 119 of Title 35 of the United States Code of the foreign applications for patent or inventor's certificate listed below, and I have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Applications

Priority

No.	Country	Filed(d/m/y)	Claimed
98-27915	Republic of Korea	10/07/98	Yes

As name inventors, we hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: (list name and Registration number):

Lloyd McAulay, Reg. No. 20,423;  
 Jules E. Goldberg, Reg. No. 24,408;  
 William J. Sapone, Reg. No. 32,518;  
 Henry D. Coleman, Reg. No. 32,559;  
 Eugene LeDonne, Rdg. No. 35,930;

J. Harold Nissen, Reg. No. 17,283;  
 Francis C. Hand, Reg. No. 22,280;  
 Gerald H. Kiel, Reg. No. 25,116;  
 Henry J. Sacco, Jr, Reg. No. 36,662;  
 Jeffrey A. Steck, Reg. No. 40,184

McAulay Fisher Nissen Goldberg & Kiel, LLP  
261 Madison Avenue,  
New York, New York 10016-2391

We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of inventor #1 : JUNG, Kwang-Ho  
Post office address and residence of inventor: 716-14 Chung-dong, Wonmi-ku, Puchon-shi, Kyonggi-do  
Republic of Korea  
Citizenship of Inventor: Republic of Korea  
Inventor's Signature: [Signature]  
Date: JUNE 30, 1999

Full name of inventor #2 : HAN, Woo-Sic  
Post office address and residence of inventor: 204-5 Kuseo-2-dong, Keumjung-dong, Pusan  
Republic of Korea  
Citizenship of Inventor: Republic of Korea  
Inventor's Signature: [Signature]  
Date: JUNE 30, 1999




Full name of inventor #3 : CHOI, Jung-Eun

Post office address and residence of inventor:

5 176-2 201 Samjun-dong, Songpa-ku, Seoul  
Republic of Korea

Citizenship of Inventor: Republic of Korea

10 Inventor's Signature: 

Date: JUNE 30, 1999